

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A dynamic bandwidth updating method for a communications system in which a plurality of subscriber apparatuses and a station apparatus are connected to the same transmission channel for bidirectional communication, for dynamically updating a bandwidth allocated in a direction of upstream transmission from the subscriber apparatuses to the station apparatus, comprising the steps of:

calculating a bandwidth usage rate from a bandwidth allocated in a bandwidth updating period and a bandwidth actually used in the bandwidth updating period; and determining a bandwidth to be allocated in a subsequent bandwidth updating period based on the bandwidth usage rate,

wherein the allocation of bandwidth involves ensuring that a minimum guaranteed bandwidth guaranteeing a minimum level of communication is allocated to the subscriber apparatus, and determining a surplus bandwidth which is a result of subtraction of the minimum guaranteed bandwidth from an allocated bandwidth, and

the surplus bandwidth is calculated using a first upper threshold value for determination that there is a bandwidth shortage when an allocated bandwidth is equal to the minimum guaranteed bandwidth, a second upper threshold value for determination that there is a bandwidth shortage when the allocated bandwidth is larger than the minimum guaranteed bandwidth and a lower threshold value for determination that there is an excessive bandwidth when the allocated bandwidth is larger than the minimum guaranteed bandwidth.

Claim 2 (Currently Amended): A bandwidth updating method for a communications system in which a plurality of subscriber apparatuses, each connected to respective subscriber

terminal apparatuses, and a station apparatus are connected to the same transmission channel for bidirectional communication, for dynamically updating a bandwidth allocated in a direction of upstream transmission from the subscriber terminal apparatuses to the station apparatus via the subscriber apparatuses, comprising the steps of:

calculating a bandwidth usage rate from a bandwidth allocated in a bandwidth updating period and a bandwidth actually used in the bandwidth updating period; and  
determining a bandwidth to be allocated in a subsequent bandwidth updating period based on the bandwidth usage rate,

wherein the allocation of bandwidth involves ensuring that a minimum guaranteed bandwidth guaranteeing a minimum level of communication is allocated to the subscriber terminal apparatus, and determining a surplus bandwidth which is a result of subtraction of the minimum guaranteed bandwidth from an allocated bandwidth, and

the surplus bandwidth is calculated using a first upper threshold value for determination that there is a bandwidth shortage when an allocated bandwidth is equal to the minimum guaranteed bandwidth, a second upper threshold value for determination that there is a bandwidth shortage when the allocated bandwidth is larger than the minimum guaranteed bandwidth and a lower threshold value for determination that there is an excessive bandwidth when the allocated bandwidth is larger than the minimum guaranteed bandwidth.

Claims 3-4 (Cancelled).

Claim 5 (Previously Presented): The bandwidth updating method according to claim 1, further comprising the steps of:

calculating in the subscriber apparatus a requested surplus bandwidth requested of the station apparatus; and

determining in the station apparatus the surplus bandwidth based on the requested surplus bandwidth, so as to determine the bandwidth to be allocated.

Claim 6 (Previously Presented): The bandwidth updating method according to claim 2, further comprising the steps of:

calculating in the subscriber terminal apparatus a requested surplus bandwidth requested of the station apparatus; and

determining in the station apparatus the surplus bandwidth based on the requested surplus bandwidth, so as to determine the bandwidth to be allocated.

Claims 7-8 (Cancelled).

Claim 9 (Currently Amended): The bandwidth updating method according to claim [[7]] 1, wherein, when it is determined, in a case in which the allocated bandwidth is equal to the minimum guaranteed bandwidth, that the bandwidth usage rate exceeds the first upper threshold value or when it is determined, in a case in which the allocated bandwidth is larger than the minimum guaranteed bandwidth, that the bandwidth usage rate exceeds the second threshold value, the surplus bandwidth is calculated such that a maximum bandwidth set up for the subscriber apparatus is allocated to the subscriber apparatus in the subsequent bandwidth updating period.

Claim 10 (Currently Amended): The bandwidth updating method according to claim [[8]] 2, wherein, when it is determined, in a case in which the allocated bandwidth is equal to the minimum guaranteed bandwidth, that the bandwidth usage rate exceeds the first upper threshold value or when it is determined, in a case in which the allocated bandwidth is larger

than the minimum guaranteed bandwidth, that the bandwidth usage rate exceeds the second threshold value, the surplus bandwidth is calculated such that a maximum bandwidth set up for the subscriber terminal apparatus is allocated to the subscriber terminal apparatus in the subsequent bandwidth updating period.

Claim 11 (Currently Amended): The bandwidth updating method according to claim [[7]] 1, wherein, when it is determined, in a case in which the allocated bandwidth is larger than the minimum guaranteed bandwidth, that the bandwidth usage rate exceeds the lower threshold value but does not exceed the second upper threshold value, the surplus bandwidth is calculated such that a bandwidth currently allocated to the subscriber apparatus continues to be allocated to the subscriber apparatus in the subsequent bandwidth updating period.

Claim 12 (Currently Amended): The bandwidth updating method according to claim [[8]] 2, wherein, when it is determined, in a case in which the allocated bandwidth is larger than the minimum guaranteed bandwidth, that the bandwidth usage rate exceeds the lower threshold value but does not exceed the second upper threshold value, the surplus bandwidth is calculated such that a bandwidth currently allocated to the subscriber terminal apparatus continues to be allocated to the subscriber terminal apparatus in the subsequent bandwidth updating period.

Claim 13 (Currently Amended): The bandwidth updating method according to claim [[7]] 1, wherein, when it is determined, in a case in which the allocated bandwidth is larger than the minimum guaranteed bandwidth, that the bandwidth usage rate does not exceed the lower threshold value, the surplus bandwidth is calculated such that the bandwidth, actually used in the bandwidth updating period for determination of the surplus bandwidth, is at a

level in the middle of the second upper threshold value and the lower threshold value for the bandwidth allocated in the subsequent bandwidth updating period.

Claim 14 (Currently Amended): The bandwidth updating method according to claim [[8]] 2, wherein, when it is determined, in a case in which the allocated bandwidth is larger than the minimum guaranteed bandwidth, that the bandwidth usage rate does not exceed the lower threshold value, the surplus bandwidth is calculated such that the bandwidth, actually used in the bandwidth updating period for determination of the surplus bandwidth, is at a level in the middle of the second upper threshold value and the lower threshold value for the bandwidth allocated in the subsequent bandwidth updating period.

Claim 15 (Original): The bandwidth updating method according to claim 5, wherein the surplus bandwidth is calculated by weighting a dynamically allocatable bandwidth, a difference between a maximum bandwidth and the minimum guaranteed bandwidth, by the requested surplus bandwidth and a parameter that serves as a reference for a charge incurred.

Claim 16 (Original): The bandwidth updating method according to claim 6, wherein the surplus bandwidth is calculated by weighting a dynamically allocatable bandwidth, a difference between a maximum bandwidth and the minimum guaranteed bandwidth, by the requested surplus bandwidth and a parameter that serves as a reference for a charge incurred.

Claim 17 (Original): The bandwidth updating method according to claim 1, wherein a bandwidth allocated to the subscriber apparatus does not exceed a maximum bandwidth set up for the subscriber apparatus.

Claim 18 (Original): The bandwidth updating method according to claim 2, wherein a bandwidth allocated to the subscriber terminal apparatus does not exceed a maximum bandwidth set up for the subscriber terminal apparatus.

Claim 19 (Currently Amended): A dynamic bandwidth updating apparatus for a communications system in which a plurality of subscriber apparatuses and a station apparatus are connected to the same transmission channel for bidirectional communication, for dynamically updating a bandwidth allocated in a direction of upstream transmission from the subscriber apparatuses to the station apparatus, wherein

a bandwidth usage rate is calculated from a bandwidth allocated in a bandwidth updating period and a bandwidth actually used in the bandwidth updating period, and a bandwidth to be allocated in a subsequent bandwidth updating period is determined based on the bandwidth usage rate,

wherein the allocation of bandwidth involves ensuring that a minimum guaranteed bandwidth guaranteeing a minimum level of communication is allocated to the subscriber apparatus, and determining a surplus bandwidth which is a result of subtraction of the minimum guaranteed bandwidth from an allocated bandwidth, and  
the surplus bandwidth is calculated using a first upper threshold value for determination that there is a bandwidth shortage when an allocated bandwidth is equal to the minimum guaranteed bandwidth, a second upper threshold value for determination that there is a bandwidth shortage when the allocated bandwidth is larger than the minimum guaranteed bandwidth and a lower threshold value for determination that there is an excessive bandwidth when the allocated bandwidth is larger than the minimum guaranteed bandwidth.

Claim 20 (Currently Amended): A bandwidth updating apparatus for a communications system in which a plurality of subscriber apparatuses, each connected to respective subscriber terminal apparatuses, and a station apparatus are connected to the same transmission channel for bidirectional communication, for dynamically updating a bandwidth allocated in a direction of upstream transmission from the subscriber terminal apparatuses to the station apparatus via the subscriber apparatuses, wherein

a bandwidth usage rate is calculated from a bandwidth allocated in a bandwidth updating period and

a bandwidth actually used in the bandwidth updating period, and a bandwidth is determined to be allocated in a subsequent bandwidth updating period based on the bandwidth usage rate,

wherein the allocation of bandwidth involves ensuring that a minimum guaranteed bandwidth guaranteeing a minimum level of communication is allocated to the subscriber terminal apparatus, and determining a surplus bandwidth which is a result of subtraction of the minimum guaranteed bandwidth from an allocated bandwidth, and

the surplus bandwidth is calculated using a first upper threshold value for determination that there is a bandwidth shortage when an allocated bandwidth is equal to the minimum guaranteed bandwidth, a second upper threshold value for determination that there is a bandwidth shortage when the allocated bandwidth is larger than the minimum guaranteed bandwidth and a lower threshold value for determination that there is an excessive bandwidth when the allocated bandwidth is larger than the minimum guaranteed bandwidth.